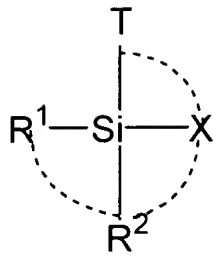

where T is the transferable group that can be selected from an aromatic group, a substituted aromatic group, a heteroaromatic group, an olefinic group, a substituted olefinic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, a substituted allenic group, an alkyl group, and a substituted alkyl group;

X is selected from the group consisting of a hydrogen, an alkyl group, a substituted alkyl group, an olefinic group, a substituted olefinic group, an acetylenic group, a substituted acetylenic group, an aromatic group, a substituted aromatic group, a heteroaromatic group, a halide, OR or $N(R)_2$ groups, where R is hydrogen, an alkyl group or a substituted alkyl group, and a silane or siloxane group; and

R^1 and R^2 are, independently, selected from the group consisting of alkyl or substituted alkyl groups, a silane group or a siloxane group; and where dashed lines indicate that any two of R^1, R^2, T or X can be covalently linked and R^1 and R^2 can be a transferable group T;

with an organic electrophile R^3Y in the presence of a basic and nucleophilic activator anion and a Group 10 metal catalyst; and

b. recovering the desired cross-coupling product $T\text{-}R^3$ in which the -C-C- bond is formed.

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94. The method of claim 93 wherein the activator anion is present at a level in molar equivalents in excess of the organosilicon reagent.

95. The method of claim 93 wherein the activator anion is present in an amount in molar equivalents ranging from about 2 to 3 times that of the organosilicon nucleophile.

96. The method of claim 93 wherein the activator anion is hydride.

97. The method of claim 93 wherein the activator anion is a trialkyl silanolate.

98. The method of claim 93 wherein the activator anion is trimethyl silanolate.

99. The method of claim 93 wherein the activator anion is fluoride-free.

100. The method of claim 93 wherein the activator is a tetraalkylammonium fluoride, tetraalkylammonium hydroxide, or a tetraalkylammonium alkoxide.

101. The method of claim 93 wherein the activator is a tetrabutylammonium fluoride, tetrabutylammonium hydroxide, or a tetrabutylammonium alkoxide.

102. The method of claim 93 further comprising the step of combining the organosilicon reagent with the activator anion to activate the organosilicon reagent before it is reacted with the organic electrophile.

103. The method of claim 93 wherein the Group 10 metal catalyst is a palladium catalyst.

104. The method of claim 93 wherein the palladium catalyst is selected from the group consisting of $Pd(dba)_2$; $Pd(dba)_3$; $[Pd(allyl)Cl]_2$; $PdCl_2$; $Pd(OAc)_2$; $Pd(OTFA)_2$; $(COD)PdBr_2$; $Pd(OTf)_2$; and $(PhCN)_2PdCl_2$.

105. The method of claim 93 wherein the palladium catalyst is $Pd(dba)_2$ or $[Pd(allyl)Cl]_2$.

106. The method of claim 93 wherein the reaction is carried out in a polar aprotic solvent.

107. The method of claim 93 wherein the reaction is carried out in a solvent selected from an ether, DMF, THF, CH_3CN, TBME and mixtures thereof.

108. The method of claim 93 wherein the method is carried out in DMF or DME.

109. The method of claim 93 wherein the reaction is carried out at ambient temperature.

110. The method of claim 93 wherein the organosilicon reagent is an aromatic or alkenylsilanol.

111. The method of claim 110 wherein T is selected from the group consisting of an olefinic group, a substituted olefinic group, an aromatic group, a substituted aromatic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, a substituted allenic group, an alkyl group, and a substituted alkyl group.

112. The method of claim 110 wherein T is selected from the group consisting of an olefinic group, a substituted olefinic group, an aromatic group, a substituted aromatic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, and a substituted allenic group.

113. The method of claim 110 wherein T is an olefinic group, or a substituted olefinic group.

114. The method of claim 93 wherein the organosilicon reagent is an alkenyl silanol.

115. The method of claim 114 wherein T is selected from the group consisting of an olefinic group, a substituted olefinic group, an aromatic group, a substituted aromatic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, a substituted allenic group, an alkyl group, and a substituted alkyl group.

116. The method of claim 114 wherein T is selected from the group consisting of an olefinic group, a substituted olefinic group, an aromatic group, a substituted aromatic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, and a substituted allenic group.

117. The method of claim 114 wherein T is an olefinic group, or a substituted olefinic group.

118. The method of claim 93 wherein in the organic electrophile, R^3Y, Y is a leaving group and R^3 is the acceptor group which is selected from the group consisting of an aromatic group, a substituted aromatic group, a heteroaromatic group, an olefinic group, a substituted olefinic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, a substituted allenic group, an alkyl group, and a substituted alkyl group.

119. The method of claim 93 wherein in the organic electrophile, R^3Y, Y is a leaving group and R^3 is the acceptor group which is selected from the group consisting of an aromatic group, a substituted aromatic group, an olefinic group, a substituted olefinic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, and a substituted allenic group.

120. The method of claim 93 wherein in the organic electrophile, R^3Y, Y is a leaving group and R^3 is the acceptor group which is selected from the group consisting of an aromatic group, a substituted aromatic group, an olefinic group, and a substituted olefinic group.

121. The method of claim 93 wherein in the organic electrophile, R^3Y, Y is a leaving group and R^3 is the acceptor group is an aromatic group, a heteroaromatic group, or a substituted aromatic group.

122. The method of claim 121 wherein T is an aromatic group or a substituted aromatic group.

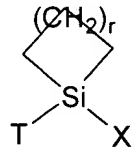
123. The method of claim 121 wherein T is an olefinic group or a substituted olefinic group.

124. The method of claim 93 wherein in the organic electrophile, R^3Y, Y is a leaving group and R^3 is the acceptor group is an aromatic group, a heteroaromatic group or a substituted aromatic group.

125. The method of claim 121 wherein T is an aromatic group or a substituted aromatic group.

126. The method of claim 121 wherein T is an olefinic group or a substituted olefinic group.

127. The method of claim 93 wherein the organosilicon reagent has the formula:



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where X is, a hydrogen, a halide, an alkyl group, a substituted alkyl group, or an OR group, where R is a hydrogen, an alkyl group or a substituted alkyl group.

128. The method of claim 127 wherein X is OR.

129. The method of claim 128 wherein X is OH.

130. The method of claim 127 wherein T is an alkenyl group or a substituted alkenyl group.

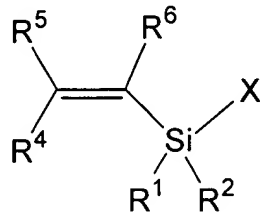
131. The method of claim 127 wherein T is an aromatic group, a substituted aromatic group or a heteroaromatic group.

132. The method of claim 127 where r is 1.

133. The method of claim 132 wherein X is OH.

134. The method of claim 133 wherein T is selected from the group consisting of an olefinic group, a substituted olefinic group, an aromatic group, a substituted aromatic group and a heteroaromatic group.

135. The method of claim 93 wherein the organosilicon reagent has the formula:



where X is a hydrogen or an OH or an OR group;

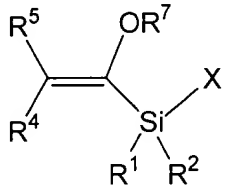
R^1 and R^2 are independently selected from the group consisting of alkyl or substituted alkyl groups wherein R^1 and R^2 may be covalently linked to each other; and

R^{4-6} are independently selected from H, alkyl, substituted alkyl, alkoxy, aryl or substituted aryl groups wherein any two of R^1, R^2, R^4, R^5, or R^6 may be covalently linked.

136. The method of claim 135 wherein X is OH.

137. The method of claim 136 wherein R^{4-6} are independently selected from the group consisting of H, alkyl, and substituted alkyl wherein any two of R^1, R^2, R^4, R^5, or R^6 may be covalently linked.

138. The method of claim 93 wherein the organonucleophile has the formula:



where X is a hydrogen or an OH or an OR group;

R^1 and R^2 are independently selected from the group consisting of alkyl or substituted alkyl groups wherein R^1 and R^2 may be covalently linked to each other; and

R^{4-5} and R^7 are independently selected from H, alkyl, substituted alkyl, alkoxy, aryl or substituted aryl groups wherein any two of R^1, R^2, R^4, R^5, or R^7 may be covalently linked.

139. The method of claim 138 wherein X is OH.

140. The method of claim 139 wherein R^{4-6} are independently selected from the group consisting of H, alkyl, and substituted alkyl wherein any two of R^1, R^2, R^4, R^5, or R^6 may be covalently linked.

141. The method of claim 93 wherein in T groups that contain $-CH_2-$ groups one or more non-neighboring $-CH_2-$ groups can be replaced with -O-; -S-; -NH- ; –NH-CO-; -NR-, or –NR-CO-, where R is alkyl; -C=O; or -O-C=O.

142. The method of claim 93 wherein the T group is substituted with one or more groups selected from a halide; and acyl group; an OR or $N(R)_2$ group, where R is a hydrogen, an alkyl or aryl group; an SR' group, where R' is an alkyl, aryl group, a substituted alkyl group, or a substituted aryl group.

143. The method of claim 93 wherein the organoelectrophile is an aryl halide, a heteroaryl halide, or a substituted aryl halide.

144. The method of claim 143 wherein the organoelectrophile is an aryl iodide or a substituted aryl iodide.

145. The method of claim 93 wherein the organoelectrophile is an alkenyl halide or a substituted alkenyl halide.

146. The method of claim 93 wherein the organoelectrophile is an alkenyl iodide or a substituted alkenyl iodide.

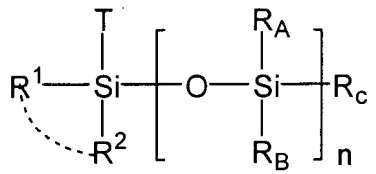
147. The method of claim 93 wherein the activator anion is added as a salt of the activator anion.

148. The method of claim 147 wherein the salt of the activator anion is not a silver salt.

149. The method of claim 147 wherein the salt of the activator anion is not AgOTf, $AgBF_4$, or $AgNO_3$.

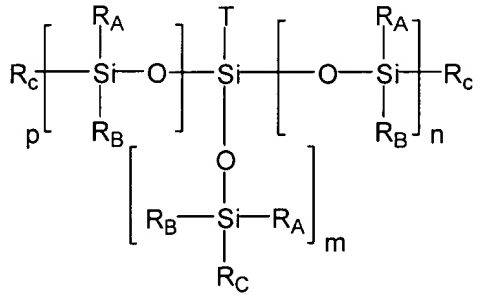
150. The method of claim 147 wherein the salt of the activator anion is not Ag_2O.

151. The method of claim 93 wherein the organosilicon reagent has the formula:



where n is an integer greater than or equal to 1; and R_A, R_B and R_C, independently, are selected from the group consisting of an alkyl group, a substituted alkyl group, a halide, an OR or NR_2 group, where each R independently of other R groups is a hydrogen, an alkyl group or a substituted alkyl group, or any of R_A, R_B or R_C can be transferable groups, and wherein any two of R_A, R_B and R_C can be covalently linked.

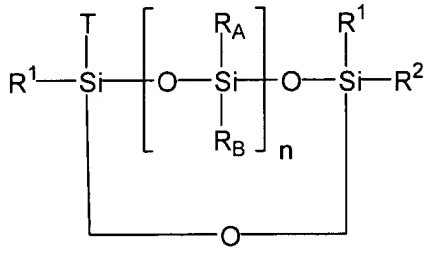
152. The method of claim 93 wherein the organosilicon nucleophile is:



wherein n, m and p are zero or integers that are greater than or equal to 1 and wherein at least one of n, m or p is 1 or greater; and R_A, R_B and R_C, independently, are selected from the group consisting of an alkyl group, a substituted alkyl group, a halide, an OR or NR_2 group, where each R independently of other R groups is a hydrogen, an alkyl group or a substituted

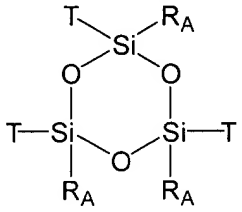
alkyl group, or any of R_A, R_B or R_C can be transferable groups, and wherein any two of R_A, R_B and R_C can be covalently linked.

153. The method of claim 93 wherein the organosilicon nucleophile has the formula:

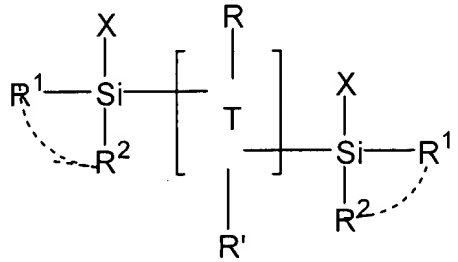


where n is an integer greater than or equal to 1, R_A and R_B, independently, are selected from the group consisting of an alkyl group, a substituted alkyl group, a halide, an OR or NR_2 group, where each R independently of other R groups is a hydrogen, an alkyl group or a substituted alkyl group, or one or both or R_A and R_B can be transferable groups.

154. The method of claim 153 wherein the organosilicon nucleophile has the formula:

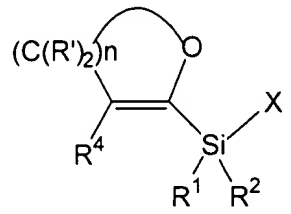


155. The method of claim 93 wherein the organosilicon reagent has the formula:



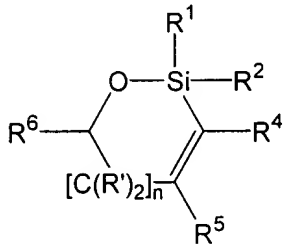
wherein R and R', independently, can be R^1, R^2 or X groups.

156. The method of claim 93 wherein the organosilicon reagent has the formula:



where n is 2-4.

157. The method of claim 93 wherein the organosilicon nucleophile has the formula:

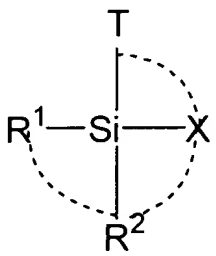


where n is 0, 1, 2, or 3, R^1 and R^2 independently are selected from alkyl or substituted alkyl groups, R^{4-6} are selected from hydrogen, alkyl, substituted alkyl, alkoxy, aryl, substituted aryl, or heteroaromatic groups, and R' are independently selected from hydrogen, alkyl or substituted alkyl groups.

158. The method of claim 93 wherein the organosilicon nucleophile is a siloxane.

159. The method of claim 93 wherein the organosilicon nucleophile is a bis-silyl compound.

160. A kit for performing a cross-coupling reaction which comprises one or more organosilicon reagents of formula:



where T is the transferable group that can be selected from an aromatic group, a substituted aromatic group, a heteroaromatic group, an olefinic group, a substituted olefinic group, an allylic group, a substituted allylic group, an acetylenic group, a substituted acetylenic group, an allenic group, a substituted allenic group, an alkyl group, and a substituted alkyl group;

X is selected from the group consisting of a hydrogen, an alkyl group, a substituted alkyl group, an olefinic group, a substituted olefinic group, an acetylenic group, a substituted acetylenic group, an aromatic group, a substituted aromatic group, a heteroaromatic group, a halide, OR or $N(R)_2$ groups, where R is hydrogen, an alkyl group or a substituted alkyl group, and a silane or siloxane group; and

R^1 and R^2 are, independently, selected from the group consisting of alkyl or substituted alkyl groups, a silane group or a siloxane group; and where dashed lines indicate that any two of R^1, R^2, T or X can be covalently linked in combination with an activating anion.

161. The kit of claim 160 wherein the activator anion is hydride,

162. The method of claim 93 wherein the activator anion is a trialkyl silanolate.

163. The method of claim 93 wherein the activator anion is trimethyl silanolate.

164. The method of claim 93 wherein the activator anion is fluoride-free.

165. The method of claim 93 wherein the activator is a tetraalkylammonium fluoride, tetraalkylammonium hydroxide, or a tetraalkylammonium alkoxide.